

## ABSTRACT OF THE DISCLOSURE

A database is compiled of values of the frequency  $f_{NM}$  corresponding to the minimum reactance  $Z''_{MIN}$  (Nyquist minimum) versus temperature  $T_L$  over a selected range of temperatures for a probe immersed in a sample of the fluid to be monitored and excited by an a.c. voltage and the frequency swept over a range to cover both bulk fluid and electrode interface impedance characteristics. The probe is then excited in situ and the temperature measured. The Nyquist minimum is then determined from the database and the current measured on the low frequency (interfacial) side of the Nyquist minimum. The angle  $\Theta$  of the rate of change of resistance  $Z''$  with respect to resistance  $Z'$  and magnitude of the impedance  $Z_S$  is then determined from the current measurement; and, the fluid condition  $\Psi$  determined from a previously compiled database of values of  $\Psi$ ,  $Z_S$  and  $\Theta$ .